

## Claims

1. Data acquisition module for modular data acquisition system, comprising:

connecting means on a first side for removably inserting the  
5 module in a slot of said modular acquisition system,

at least one acquisition channel, each channel comprising at least one analog-to-digital converter for converting an analog input signal into a digital signal,

at least one clock generating circuit capable of supplying an  
10 internal clock signal,

wherein at least one connector makes it possible to plug in a removable connecting element on a second external side of said module different from the first side in order to connect said module to a synchronization bus connecting several modules in said system, said connection  
15 being effected independently from the insertion of said module into said slot,

and wherein a clock selecting circuit allows the selection of either a slave-clock state, in which said converters are synchronized by said synchronization bus, or of a master-clock state in which these converters  
20 are synchronized by said internal clock signal that is also used as external synchronization signal on said synchronization bus.

2. The module of claim 1, wherein said clock generating circuit comprises a phase lock loop (PLL), a clock reference signal being applied at the input of said PLL,

25 and wherein said internal clock signal is a signal downstream of said PLL.

3. The module of claim 1, wherein a delay element enables the external synchronization signal received from the synchronization bus to be delayed.

5        4. The module of claim 3, wherein the delay applied by said delay element can be programmed.

5. The module of claim 1, wherein said connector comprises a trigger input for transmitting at least one trigger signal between adjacent modules.

10       6. The module of claim 5, wherein at least one trigger generating circuit enables a trigger signal to be generated in response to a predefined event on one of the acquisition channels.

7. The module of claim 6, wherein a trigger selecting circuit makes it possible to impose on said synchronization bus the trigger signal supplied by said trigger generating circuit.

15       8. The module of claim 1, wherein said external synchronization signal can momentarily be interrupted.

9. The module of claim 8, wherein said external synchronization signal can be interrupted according to the state of said trigger signal.

20       10. The module of one of the preceding claims, wherein said clock selecting circuit can be controlled by signals applied on said connecting means.

11. The module of claim 5, wherein said delay element can be controlled by signals applied on said connecting means.

25       12. The module of claims 7, wherein said trigger selecting circuit can be controlled by signals applied on said connecting means.

13. The module of claim 1, wherein said connector makes it possible to simultaneously plug in two removable connecting elements enabling said external synchronization signal and/or said trigger signal to be transmitted from or to two adjacent modules in said modular acquisition system.

14. The module of claim 1, wherein at least one acquisition channels comprises:

at least a demultiplexer for demultiplexing the signal supplied by said analog-to-digital converter,

at least a memory element for storing the demultiplexed signal supplied by said demultiplexer,

and wherein said trigger generating circuit is connected at the output of the demultiplexer.

15. The module of claim 1, wherein it conforms to the PCI standard,

and wherein said connector is placed on said second side on the front of said module that can be accessed by the user when said module is mounted in said modular acquisition system.

16. The module of claim 1, wherein it conforms to the CompactPCI standard,

and wherein said connector is placed on said second side on the front of said module that can be accessed by the user when said module is mounted in said modular acquisition system.

17. The module of claim 1, wherein it conforms to the PXI standard,

and wherein said connector is placed on said second side on the front of said module that can be accessed by the user when said module is mounted in said modular acquisition system.

18. The module of claim 1, wherein it conforms to the VXI  
5 standard,

and wherein said connector is placed on said second side on the front of said module that can be accessed by the user when said module is mounted in said modular acquisition system.

19. The module of claim 1, wherein said external synchronization  
10 signal is a differential signal.

20. The module of claim 1, wherein said external synchronization signal is a signal of the type ECL.

21. The module of claim 1, wherein several phase-shifted external synchronization signals can be transmitted on said bus.

15 22. Modular data acquisition system, wherein

a plurality of modules according to claim 1 are connected two by two by connecting elements comprising each a first series of pins plugged in a connector on said second front side of a first acquisition module and a second series of pins plugged in a connector on said second front side of a  
20 second acquisition module.

23. The modular system of claim 22, further comprising a clock module for supplying an external synchronization signal to one or several modules in a modular data acquisition system, wherein said clock module comprises:

25 connecting means for removably inserting the clock module in a slot of said modular acquisition system,